

Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Additional Spectrum for Unlicensed Devices)	ET Docket No. 02-380
Below 900 MHz and in the 3 GHz. Band)	

COMMENTS OF LAKELAND COMMUNICATIONS

Lakeland Communications (LAKELAND) is a Broadband System Integrator providing, installing, and maintaining licensed and unlicensed microwave systems (Part 15, 74, and 101), and wireless local area networks (WLAN) throughout the Eastern United States. Our customer base varies from a small business with a WLAN system serving several laptop PC's to Fortune 500 and federal government microwave backbone networks.

LAKELAND supports the use of low power unlicensed operations using underutilized television broadcast spectrum. With the proliferation of wireless networking now extending to the home, the present Part 15 spectrum (mainly 2.4 GHz.) has become congested in larger metro areas to a point where some systems are unusable in certain areas. This proves to be an issue for municipal, public safety and educational facilities that could greatly benefit from a wireless network but fear purchasing and deploying such networks because of the chance of interference from a simple WLAN transmitter deployed in a nearby home.

Part 15 has a role and it serves that role well considering the limitations. When the Commission first issued rules under this section, Wireless Internet Service Providers (WISP) were not even on the radar screen. Today, there is more than 7000 WISP's providing Broadband Wireless Access (BWA). Most of them are providing this service using Part 15 equipment. They range from a simple "mom and pop" operation covering a local town to wide area systems serving large scale populations. They are located in the backwoods of Oregon and in the top ten major metropolitan markets. Congress has addressed the need for every household to have Broadband Internet Access (BIA) and Part 15 is doing just that. Unfortunately the spectrum that is presently available for these services (predominately 2.4, 5.3 and 5.8 GHz.) has numerous restrictions.

Because of the poor propagation factors of microwave frequencies, line-of-sight (LOS) is a major obstruction to deploying systems in many areas of the United States. This is mainly due to dense tree canopy and construction densities. The addition of large chunks of sub-1GHz. spectrum would help address these issues. Underutilized television spectrum could provide this spectrum especially in rural markets that have extremely light or no broadcast transmitter counts. In addition, LAKELAND suggests the consideration of unlicensed use in 800 and 900 MHz. land mobile SMR spectrum in rural markets that have underutilized UHF (450-470 MHz) channels and no licensed Part 90 systems.

In considering the use of such underutilized spectrum we ask the Commission to consider "sectoring" spectrum for particular users, specifically public safety, education (schools and universities), WISP and local government. The need for "virgin" spectrum

by these entities is so great. Unfortunately they have been prevented from initiating and deploying systems because of the absence of available spectrum.

LAKELAND agrees that television broadcast spectrum can be utilized by unlicensed systems without causing harmful interference through the use of GPS and a maintained cross-referenced database. The equipment would require some method of checking the database for “updates” on a regular basis. This could be via a dial-up modem connection or a broadband connection to a third party contractor maintaining the database. We feel the Commission could provide rules where GPS and the database would only be required for equipment that is used outdoors. It should be possible to reuse underutilized television spectrum indoors with greatly reduced emission levels and low gain fixed integral antennas that would greatly minimize, if not eliminate interference levels outside the structure. In addition, we feel it is also possible to construct equipment that “monitors” the operating channel for activity prior to transmitting. This may be an option to providing GPS in all equipment as well as a way to verify against an up-to-date database. While the later method may be more “cost effective” and simpler to deploy, the ultimate goal should be to protect any channel incumbent regardless of cost.

We feel that the lower television channels (2 thru 6) should not be considered for reuse because of the potential to interference to desktop devices similar to VCR’s and cable boxes as well as susceptibility to atmospheric propagation changes that could result in interference from/to distant markets from outdoor devices. While we feel that a GPS/database could protect radio astronomy operations on channel 37, we are concerned

that medical operations on this channel may suffer due to unlicensed operations. As such, we feel that this channel should be excluded as well.

We would like to see reuse allotted in channels 52 thru 69 (698-806 MHz.). While the Commission has reallocated this spectrum to public safety and commercial entities for dispatch type communications, we would expect this spectrum to be occupied in regions where 800 and 900 MHz. Part 90 spectrum is either congested or unavailable. Rural usage of this spectrum should remain underutilized or unused because of the availability of UHF (450-470 MHz.) and 800/900 MHz. spectrum.

Unlicensed operations should be possible utilizing UHF “T” Band (470-512 MHz.) without causing interference to existing Part 90 licensees. GPS/database should make it possible to exclude operations within the markets covered under these rules. While it is also a concern to protect Canadian and Mexican licensees from interference, a GPS/database combination should prevent operations within certain distances of either border in an effort to minimize interference possibilities.

Unlicensed operations in the 3650-3700 MHz. band could provide spectrum for specific users for use indoors and outdoors. We feel that the spectrum indoors could be used in any configuration similar to the way the 2.4 GHz. band is used. Outside, the spectrum should be limited to point-to-point (PtP) operations only with high gain, narrow beam width antennas. With the known location of the three Government radiolocation incumbents, systems can be installed without causing interference. This may be possible

by preventing transmission within a certain radius, which will be verified and controlled by GPS and an internal database.

With the possibility of use of the above-mentioned spectrum, the Commission should consider new rules that would prevent the use of such spectrum and associated equipment by “consumers”. There is presently plenty of Part 15 spectrum available for the residential user as it relates to computer networking, cordless telephony and other unlicensed uses. The Commission should consider making a new rule section that would cover unlicensed networking services that especially cover wide areas (BWA). In addition, spectrum should be authorized to specific users. Public safety entities need spectrum for data services for police, fire and EMS operations. Local governments need to control traffic control devices, water irrigation and sewage lift stations. Schools and universities could use spectrum for tying together facilities with network services covering both LAN and WAN operations. And finally the WISP could use frequency spectrum to provide services to underserved broadband areas. Specific spectrum allotments would allow users to help “coordinate” operations and interference complaints amongst themselves. Under the present Part 15 rules, any type of unlicensed operation can cause interference. With only specific users using a particular spectrum, interference issues should be easier to resolve and locate.

Consideration should be made to provide rules that would allow a maximum ERP limit as it relates to the installation. At present, the Commission requires a type-accepted “system” comprised of an intentional radiator, cable and particular antenna. This limits the ability to “control” the radiation pattern of the signal in most instances. This can and

does cause cases of interference and is not spectrally efficient. The usage of two omnidirectional antennas to bridge one point to the other is an example. Point-to-point equipment should be required to have high gain, narrow beam width directional antennas. In addition, the transmitter should have a method to control the output power so the signal does not extend past the receiver “for miles”.

This brings up a strong case for some type of “professional installer”. For years the Commission required technicians repairing Part 90 equipment to be certified by the FCC and then later by a contractor approved by the Commission to test and certify individuals. There are several industry organizations as well as a large number of manufacturers that could train, test and certify individuals to install equipment under this part. The main concerns should be limiting ERP, using proper antennas for the system design, and verifying that the unit is operating properly, especially as it pertains to the way it authorizes the frequency it uses.

At present there is no way to install a system inside tunnels, hotels or large office buildings without using large numbers of transmitters to cover the area. Under other rule Parts we are allowed to install type-accepted equipment with distributed antenna systems providing that the radiated power levels are under the licensed amount. A “professional installer” would be able to construct distributed antenna systems for WLAN’s that would be more cost effective to the end user and more spectrally efficient in its operation.

The “professional installer” would also be able to combine type-accepted transmitters to antennas, amplifiers and transmission line providing it conformed with the

Commissions rules as it relates to ERP. ERP limits should be adjusted upward for rural systems to assist with penetration of foliage and other natural obstruction and to allow greater coverage where population numbers are spread over a larger geographic area.

We are confident that the industry can “self-police” itself similar to the way amateur radio does, providing spectrum is allotted for specific use by entities outlined above.

LAKELAND feels that underutilized broadcast television spectrum, 3.65-3.7 GHz. and 800/900 land mobile spectrum should be considered for use by unlicensed operations providing said use will not interfere with incumbent licensees. The availability of lower frequency spectrum, especially in rural areas, will allow the expansion of BWA to areas that cannot get these services due to geographic and foliage considerations.

We feel the benefits to the above-mentioned entities, as well as the customers they serve, is so great that this matter should attract the Commission’s utmost attention to promoting an expeditious and timely rulemaking to rapidly make this spectrum available.

Respectfully Submitted,

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